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# The three levels of digital divide in East EU countries

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## Abstract

This article brings to light significant insights into the three levels of digital divide in the particular setting of East EU. It discusses and analyses indicators related to the spread and use of the Internet (first level of digital divide), the level of digital skills (second level of digital divide), and digital services used by citizens in East EU countries to improve their quality of life (third level of digital divide). The article specifically focuses on the third level of digital divide, by analysing, on a macro level, three tangible outcomes, namely eGovernment service completion and use, eHealth in terms of seeking health related information and interacting with practitioners online, and eCommerce. Data from Eurostat, including digital scorecard and other reports, showed clear discrepancies among countries of East Europe, as well as distinct difference between some countries and overall European Union averages, suggesting the existence of two groups of countries, one as high performance in terms of services offered and high growth in terms of use, and the second is at medium performance in terms of services offered, and low in terms of growth and use.

## Keywords

Digital inequalities, digital inclusion, digital development, digital divide.

## Introduction

The aim of this paper is to bring to light meaningful insights into the three levels of digital divide in the particular setting of East Europe. Using data from

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Digital Agenda Scorecard<sup>2</sup>, this article will give an overview of inequalities between East EU countries, in terms of access to the Internet, digital skills and digital engagement. Particularly, this paper will focus on digital inequalities in the East European countries that joined the European Union after the fall of the Iron Curtain in 1989 and specifically after the dissolution in 1991 of Council for Mutual Economic Assistance (COMECON), the Warsaw Pact, and the Soviet Union. As it is well known, not all countries that regained the independence, such as Belarus, Moldova, Ukraine, joined the Europe Union, while other countries joined the European Union in different times. Czech Republic, Estonia, Poland, Hungary, Latvia, Lithuania, Slovakia, and Slovenia, for instance, joined the EU in 2004, while Bulgaria and Romania in 2007, and finally Croatia 2013. This specific area of Europe, on which our paper is focussed on, is from one side thriving in terms of development of digital technologies and online public services, and at the same time it is often lagging in terms of use of these technologies and services offered. This article will, therefore, attempt to compare and contrast differences and similarities between these countries, through the lens of digital inequalities and its consequences for everyday life. However, as it will become soon clear, it is not possible to look at this area as a unique and uniform block, as we can notice several levels of digital inequalities, corresponding to the three levels of digital inequalities. Indeed, there are still differences in terms of access (first level of digital divide), digital skills and digital competences required to use the Internet competently (second level of digital divide), and inequalities in the capacities to get the benefits from the access and use of the Internet (third level of digital divide). These three levels of digital divide are evident between these countries. Indeed, as we shall see, for instance, the Baltic countries (Estonia, Latvia and Lithuania) differ from other East Europe countries in terms of Internet penetration, while countries such Czech Republic have higher level of digital skills compared both to the EU average and to other Eastern countries. Other differences and inequalities exist in terms of how much people make use of the Internet to better themselves and their lives. The aim is to shed light into the development of digital technologies and how they are affecting citizens' relationship with online services that have the potential to enhance people's lives. More specifically, we will focus on three main outcomes that might contribute in fostering citizens' life chances, namely the availability and use of eGovernment public services, the availability and use of eHealth services, and finally the availability and use of eCommerce.

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<sup>2</sup> <https://digital-agenda-data.eu/charts/analyse-one-indicator-and-compare-countries>

The eGovernment Action Plan 2016–2020 aims to ‘engage more with citizens and businesses to deliver high quality services’ (EU, 2016). This plan followed the previous EU’s eGovernment Action Plan 2011–2015, which posed a general target of 50 per cent of citizens (digital agenda) and 80 per cent of businesses making use of eGovernment services. In this vein, previous studies on eGovernment have shown how the adoption of ICTs by public institutions will eventually foster policies and programmes, improve the quality of services offered to citizens, and widen political participation (Bourquard, 2003; Garson, 2004; Gartner, 2000). Our macro analysis brings to light some useful (though not exhaustive) insights on the digital development of EU, by analysing how East EU countries are following the eGovernment Action Plan 2016–2020. The macro analysis between countries gives an overall overview of the inequalities in terms of the first level of digital divide (accessing the Internet), second level (digital skills) and third level (getting some benefits from the Internet).

In what follows, we first briefly discuss the evolution of digital inequalities and we introduce the three levels of digital divide. Then, by using data coming from DESI 2018/Digital Agenda and focusing on the macro level, this paper will split the findings into three main subsections corresponding to the three levels of digital divide and discuss some of the social implications of these inequalities. Finally, a short conclusion section will close this article.

## **Theoretical context**

Internet penetration is rapidly increasing everywhere in the world, significantly reducing the gap between those who access and those who are excluded from the digital realm. However, while shrinking, a gap in access still persists and inequalities in accessing the Internet may be observed both between countries (global digital divide) and within countries (social and democratic digital divide). Some countries, indeed, experience high Internet penetration rendering virtually the whole population to be connected. More specifically, in Europe, some countries, such as Denmark, Luxembourg and the Netherlands have almost bridged the digital divide in terms of access, since almost everyone have access to the Internet. However, some other countries in Europe, such as Bulgaria and Romania, have lower Internet penetration rate when compared with other European countries, showing a clear gap or divide in terms of access to ICTs. Access to ICTs is the first and most obvious criterion used to investigate digital inequalities between and within countries. Indeed, as Castells (2001) pointed out, without access to the Internet, a discussion about digital inequalities would have no sense. However, physical and technological ownership and access and connectivity cannot be the only element to be taken

into consideration in analysing digital inequalities. Indeed, Internet penetration is only one part of the broader axis of digital inequalities. We cannot reduce the multidimensionality of digital divide to a dichotomous difference between those who access and those who are excluded from the digital realm (Ragnedda & Muschert, 2016). This binary division, defined as the first level of digital divide, focuses on the original idea of digital divide (Newhagen & Bucy, 2005), and provides a partial and limited picture of digital inequalities. Beyond the simple access to the Internet, other dimensions play a key role in determining digital inequalities. Indeed, as the Internet penetration increased and the gap between those who access and those who are excluded from the Internet reduced, both policy makers and scholars (Brandtz g, 2010; Chen & Wellman, 2005; DiMaggio et al., 2004; Selwyn, 2004; Van Dijk, 2005; Zillien & Hargittai, 2009) started to look at new forms of inequalities, such as the level of skills available that allows the use of the Internet in satisfactory ways (Litt, 2013) or the quality and types of Internet usage (Hargittai & Hinnant, 2008). The different support, motivation, capabilities and skills used to safely and confidently navigate the Internet are known as the second level of digital inequalities. These inequalities vary in relation to the frequency of usage, types of activities, length of time and in terms of content. Such inequalities are intertwined with socio-economic and demographic variables such as gender (Fallows, 2005; Meraz, 2008; Subrahmanyam et al., 2001; Valkenburg & Peter, 2007), age (Bonfadelli, 2002; Fox & Madden, 2005), education (Howard et al., 2001; Robinson et al., 2003; Van Dijk, 2005), income (DiMaggio et al., 2004; Ragnedda & Muschert, 2013; Zillien & Hargittai, 2009), geography (Hindman, 2000), race (Ono & Zavodny, 2008), and social capital (Ragnedda & Ruiu, 2017). Recently, scholars (Ragnedda, 2017; van Deursen & Helsper, 2015) have identified the third level of digital divide that underlines inequalities in the benefits gained from the different levels of access and usage of the Internet. By analysing the third level of digital divide, scholars start to put emphasis on social implications and inequalities in the tangible outcomes gained from different forms of access and usage of the Internet.

Against this theoretical background, we shall argue that inequalities, across Eastern European countries, are evident at all three levels of digital divide.

## **Methods and material**

To give an overview of the levels of digital divide across Europe and specifically across East EU countries, we analysed and cross matched data from European Commission research data, including DESI 2018 (Digital Economy and Society Index) and European Union Digital Agenda Scorecard reports. These composite

indices, provided by the EU, summarise relevant indicators of Europe's digital performance and digital competitiveness. We looked also at the Annual European Digital Progress Report which benchmarks developments in digital in six domains: connectivity, human capital, Internet use, digitisation of businesses, digital public services and research, development. Specifically, to determine the first level of digital divide, we looked at statistics of individuals who use the Internet regularly, defined as at least once per week. To give an overview of the second level, instead, we used the 'Digital Skills Indicator' based on the Digital Competence Framework that identifies five competence domains: information, communication, content creation, safety, and problem solving. However, it must be noted that the ICT survey collects data about activities realised during the previous three months by Internet users covering four of the five domains (excluding the safety domain). Individuals not using Internet at all are classified without digital skills, while the scores are split into three main categories: basic, above basic, and none. Finally, in order to shed light into the third level of digital divide, we looked at the inequalities in three main domains: eGovernment and public services, eHealth, and eCommerce, by using data from Communication on Digital Transformation of Health and Care in the Digital Single Market 2018 report and Eurostat 2018.

## **Findings**

By using data from DESI 2018 and Digital Agenda Scorecard we analysed several forms of digital inequalities. First of all, we looked briefly at the differences in terms of access to the Internet, to gain an understanding of gaps and trends in terms of the first level of digital divide. While Internet penetration is growing almost everywhere, and specifically in technologically advanced countries, differences in terms of access still persist. Secondly, we discuss differences and similarities amongst East EU countries, in terms of digital skills and digital capabilities in accessing and using ICT. Finally, in the third sub-section, we looked elaborately at the tangible outcomes deriving from the access to and use of ICTs that might influence the quality of citizens' life. More specifically, in this part we look at what services are migrated online and are available on the digital realm, the percentage of citizen's using them and the benefits they might gain by using them.

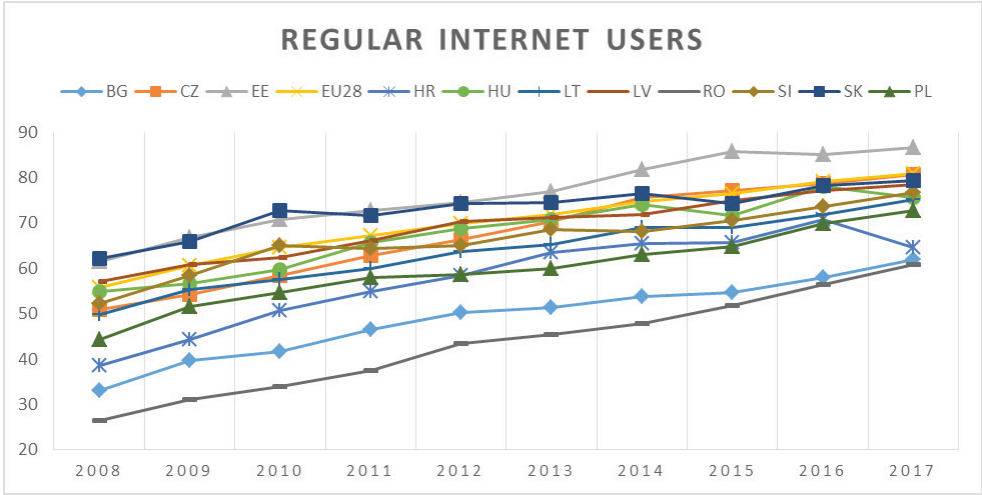
### **First level of digital divide: Gap accessing the Internet**

The trend for countries across Europe, as well as countries over the globe, is an increase in number of those individuals who access the Internet. For this reason, by looking at statistics of individuals who use the Internet regularly, defined as

at least once per week, we can have an overview of the digital inequalities in terms of access and the progress made in the last decade to close this gap.

Chart 1

**Individuals using the Internet at least once a week  
in East Europe plus EU average**



As we can see in *Chart 1*, East EU had an average annual increase of Internet users of over 2.5 percent each year with several leaps, as with Romania, which had an annual average increase of 3.4 percent, moving number of Internet users from 26 percent in 2008, to almost 60 percent in 2017 (Eurostat, 2018c). This is a significant improvement and it demonstrates the effort made by Romanian governments and private companies, in the last decade, in closing (or attempting to) the gap with other European countries. Secondly, the chart shows also that the slowest increase was in Slovakia at an annual average increase of 1.7 percent, from 62 percent in 2008, to almost 80 percent in 2017 (Eurostat, 2018c). Nonetheless, this increase still allowed Slovakia to bring the number of regular Internet users to bar with European Union average.

Although, Internet penetration is steadily rising all across Europe, it would be too optimistic to claim that inequalities in terms of access have been mended and that the first level of digital divide has been bridged. There are still significant differences between countries in terms of Internet penetration and physical access to the Internet. As already noticed, it is wrong to look at East EU countries as a uniform block in terms of access. Indeed, inequalities in access to the Internet vary significantly. Some countries, such as Romania and Bulgaria, lack Internet penetration and are far below the EU's average, while



other countries, such as Lithuania or Estonia, are above EU's average. More specifically, despite the effort in boosting the Internet infrastructures and all the policies adopted to close the first level of digital divide, inequalities in accessing the Internet is still high if we compare Romania (60%) with the Netherlands (94%) or Denmark (95%) (Eurostat, 2018c).

The digital access gap between these countries reflects differences in terms of policy adoption, infrastructural investment (both public and private), technological development, cultural and social issues, and is part of a broader picture of socio-economic differences. However, this chart shows that inequalities in accessing the Internet are still an issue, even in one of the most technological and industrialized regions in the world, and that the first level of digital divide is far to be bridged. These data show also that the number of citizens regularly using the Internet increase at different pace and rate and this is due, again, to several socio-economic and political reasons. However, what is clear is that in the decade 2008-2017 all East EU countries have improved Internet penetration and more and more citizens started not only to access but to use the Internet regularly, reducing (but not closing) the first level of digital divide.

## **Second level of digital divide: Digital skills and digital capabilities**

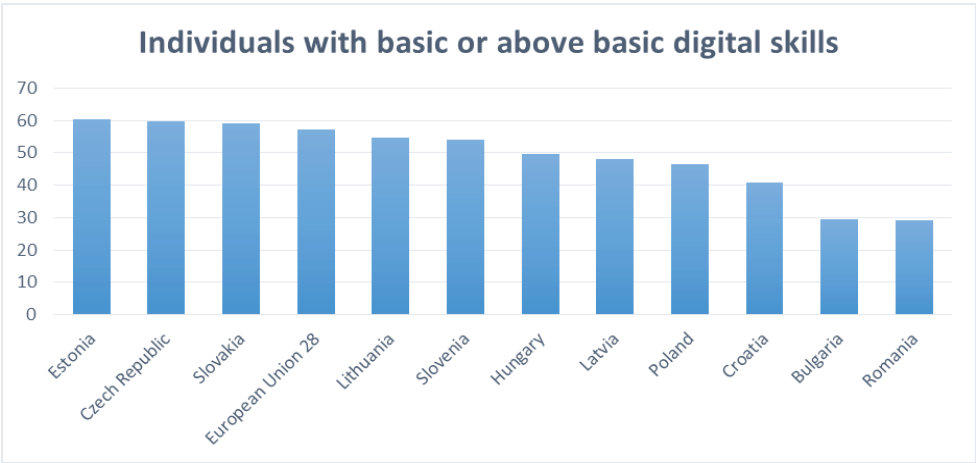
As we have seen, beyond the inequalities in accessing the Internet, there are inequalities in the digital abilities and skills to use ICTs to participate and enjoy the benefits of the information society (B chi & Vogler, 2017; Hargittai & Shaw, 2013). These inequalities in using the Internet are increasingly important in a digital-enabled society. Indeed, the greater the digital capability and skills in accessing and using the Internet, the greater the benefits. At the same time, the greater the technology is, the further disadvantaged citizens become if they do not have access to or they cannot use it properly. We have seen how different the access to the Internet across East EU countries is, specifically between the Baltic countries and Romania and Bulgaria, both positioned at the really bottom of European ranking. These inequalities in accessing the digital realm have serious social consequences, since more and more services, activities and utilities are migrating online. Indeed, those who are totally excluded from the Internet are also excluded from accessing these services and enjoying the benefits of the Internet. However, accessing alone is not enough if citizens do not have enough motivation, capacities and skills to use the Internet. These inequalities, as we have seen, are labelled as the second level of digital divide. Differently than for the first level of digital divide where it is easier to analyse these inequalities by looking at the number of people accessing regularly to the



Internet and those who are totally excluded, in the second level of digital divide many different dimensions should be considered. We focused our attention on one of the main indicators of digital inequalities, namely the level of digital skills, which play a key role in determining inequalities in using the Internet. These inequalities influence not only the way citizens use and maximize the benefits of their Internet use (Lee et al., 2011) but also how confident they are using the Internet (Eachus & Cassid, 2006; Eastin & LaRose, 2000), the sense of privacy and security (Janssen et al., 2013), the capacities to manage information (Ahmad et al., 2016), communicate (Siddiq et al., 2016) or collaborate (Choy et al., 2016) with others, and are part of broader factors that help in preventing social exclusion (Facer & Furlong, 2001). Digital skills and competencies are, therefore, vital in the information age, since they determine and influence our everyday life.

Chart 2

Percentage of people with skills allowing for meaningful Internet use



As per access, inequalities across East EU countries are found also in terms of digital skills. Indeed, as *Chart 2* shows, the different levels of digital skills are quite evident. Countries such as Estonia, Czech Republic and Slovakia, are above the European Union average. In the case of Estonia and Czech Republic this is in line with the Internet penetration's data, where both these countries are above Europe Union average, demonstrating a good performance both in terms of access and digital skills. Slovakia, by contrast, is below the European Union average regarding the Internet penetration, while is above in terms of digital skills. This shows that digital skills do not improve automatically by

increasing the number of people who regularly access the Internet. Digital skills are, therefore, related to other factors such as the overall level of education, digital literacy programmes and digital training courses.

At the very bottom of this rank, we find Bulgaria and Romania well below the European Union average. These data pair with similar performance in terms of Internet penetration, making these countries among the worst in Europe in terms of digital access and digital capabilities. The digital skills indicator is vital because it allows us to understand differences between people having, or missing, some basic digital skills to move confidently in the digital realm. From a macro level point of view, these inequalities also show the differences between East EU countries in the way citizens are 'ready' and prepared to use digital facilities and services in the information society and to access the job market than increasingly require some forms of digital skills. Since social and digital inequalities are strongly intertwined, the reasons beyond these inequalities must be looked in the social, political, cultural and educational differences between these countries.

### **Third level of digital divide: Tangible benefits of using the Internet**

The third level of digital divide, as noted above, refers to the inequalities in the tangible benefits users gain by accessing and using the Internet. While it is difficult to map all social, cultural, political, personal and economic benefits individuals may get from an appropriate access and proper usage, in this section we have included several benefits from being online. Particularly, we have focused on three main features that influence the everyday life of citizens: eGovernment and public services, eHealth, and eCommerce.

### **Digital public service**

The first main tangible outcome on which we focused our analysis is the level of interaction with digital public service. As noticed, more and more public services are migrating online, thus increasing the importance for citizens' everyday life to digitally engage with these services to improve their quality of life. We collected data from the EU eGovernment Benchmark 2016 report (European Commission, 2016b), which discussed the differences in performance of EU countries in terms of average growth and absolute score, ranked countries to Accelerators, Steady Performers, and Moderate Performers. The accelerators are the countries with over EU28 average in both average growth and absolute score, Steady Performers are countries with absolute score above EU28 average, and average growth that is below that, while Moderate Performers are countries

that are below EU average in both metrics. The Baltic states – Estonia, Latvia, and Lithuania – were all ranked as Accelerators, with the rest of countries efforts putting them as Moderate Performers. The report suggested the rise of a ‘Digital Diagonal’ across Europe, moving from south-west to north-east across Europe, with countries ranked as accelerators. The lack of Steady Performers in East Europe further demonstrates the divergence in performance among countries of East Europe.

By looking at the level of online services completion data, Eastern EU countries are following, to a certain extent, the EU general plans to offer public services online. However, differences between and within countries persist in terms of what government may offer to citizens, and more notably in citizen’s usage and readiness to embrace these new services. These differences are rooted in the already existing social inequalities. Richer and more technologically advanced countries, such as countries of Northern Europe, are the first to propose projects to improve eGovernment and making use of eGovernment services by rendering it responsive to individual needs. In addition, on local level within each country, inequalities in the use of governmental services over the Internet are determined by vital variables of social inequalities, such as education and occupation (White & Selwyn, 2013).

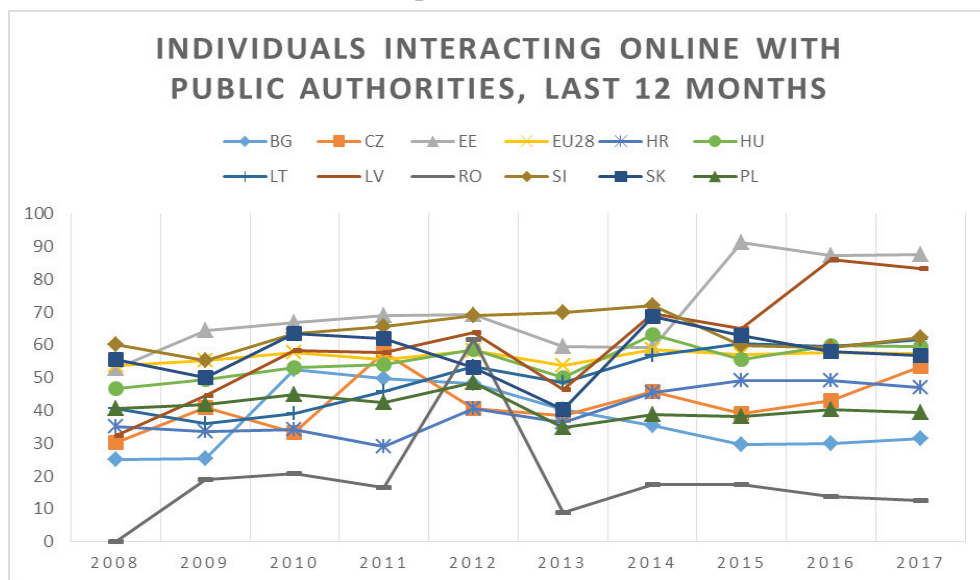
Additional rationale behind the divergence in performance can be related to the quality and usability of services offered. Although the percentage of services available online may seem high, the quality and usability differ a lot among countries. The EU, as part of a methodology established in the eGovernment Benchmark Framework 2012-2015 (European Commission, 2012), used mystery shoppers to assess eGovernment services offered. The mystery shoppers would simulate life events conducted by citizens, such as regular business operation, car ownership, job search, moving locations, small claims, and issues related to studies and setting up a small business, were covered in 2015 and 2016 editions of the EU eGovernment reports (European Commission, 2015, 2016).

Disparities between what services are available and the percentage of citizens’ using them is a clear indicator of Internet use gap between countries. For eGovernment services, this can be clearly seen by comparing trends of online interaction with public authorities online, with the percentage of services that can be completed online in a public service life event, and the change in Internet penetration rates. The data available shows that most countries in the EU provide online facilities to complete most public service events, with an average of over 80 percent of public services available, and can be completed online for countries of the European Union (Capgemini, 2015). The difference in level of

services available online is narrowing, converging to almost 100 percent as in Estonia, with no country having less than half of its public services available as online services.

Chart 3

### Change in percentage of general public interacting online with public authorities



Nonetheless, the number of people interacting online with public authorities (Chart 3), although is generally increasing, does not correspond to the same trend line and distribution of Internet users. In East EU, the percentage of individuals interacting online with public authorities has been increasing at an average of 1.6 percent each year, with Latvia leading with over 5 percent average increase in the past 10 years pushing percentage of people interacting online with authorities from 32 percent in 2008 to over 83 percent in 2017, while countries like Slovakia, Slovenia, and Bulgaria had a shy average annual increase of 0.14, 0.22, 0.62 percent respectively, hovering around the European Union total average annual increase of 0.36 percent. Poland was the only country to actually have a total decrease, though slight, of 0.12 percent annually (Eurostat, 2018a).

Comparing the annual average increase, although gives a great perspective into efforts put towards inclusion in online governmental services and their effectiveness, lacks the context of actual percentage of individuals interacting with the government online. When compared to the EU total average annual

increase, only two countries in East Europe are below that average, namely Slovakia and Slovenia. These two have done better than other countries in Europe, in increasing number of people interacting with governments online. However, this gives a false impression that the overall situation of eGovernment usage is better there, neglecting that the baseline these countries started with a decade ago varied a lot. The two countries with the least positive average annual increase in online interaction with the government are in fact doing well in terms of actual percentages of individuals interacting with their government online. These two countries, Slovakia and Slovenia, were leading Eastern European countries in 2008 as the top two countries, with 55 percent and 60 percent respectively, followed by Estonia at 53 percent and Hungary at 47 percent. However, they did not better enough in this decade, allowing other countries to bypass them. This is similar to poor performance of Poland, which is the only country with the decrease, and which was sitting at the fifth position in East Europe with over 40 percent in 2008, almost maintaining the percentage a decade later at 39 percent, but dropping to the ninth position. In 2017, the leading countries were Estonia with 88 percent, and Latvia with 83 percent springing from 53 and 32 percent in 2008 respectively. The countries that started from the lowest baseline were Romania with zero percent use, and Bulgaria with 25 percent. These countries have shown clear efforts in filling the gaps, by increasing to 13 and 31 percent respectively.

## **eHealth**

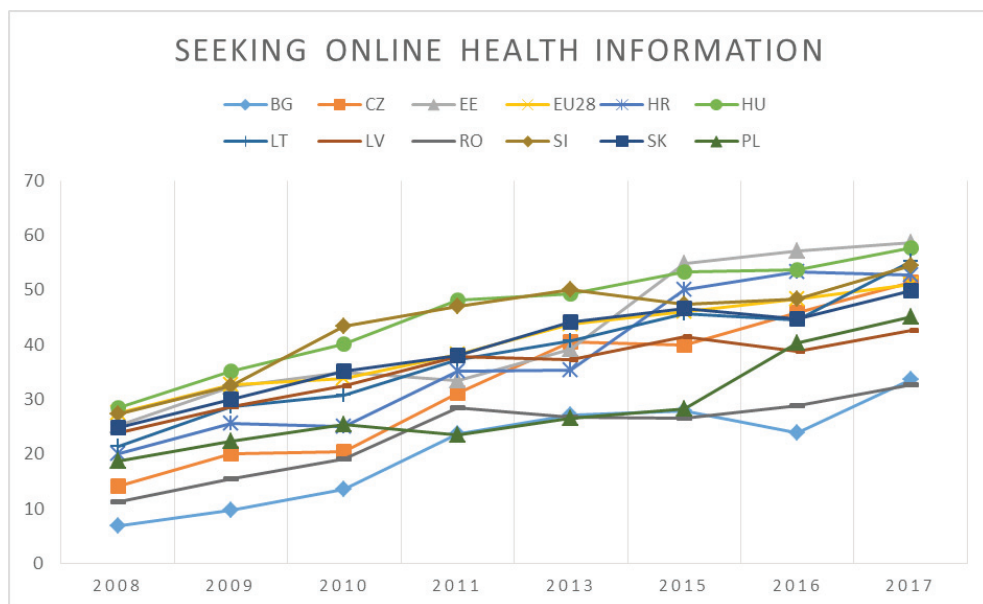
The second major tangible outcome we analysed, in order to see inequalities in the way citizens use the Internet to improve their life and get benefits, is the eHealth. This includes services offered either by the government or health practitioners to allow for electronic interaction with patients or, among them including, but not limited to, making appointments and accessing and sharing medical records, in addition to the use of other resources available online to access health-related information and advice. A comparative look at both gives us an idea on the level of motivation citizens have to use eHealth services and access related information.

In its latest Communication on Digital Transformation of Health and Care in the Digital Single Market (European Commission, 2018) the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions concluded that the uptake of digital solutions for health and care, or eHealth, remains slow and varies greatly across Member States and regions of Europe. The communication set three main priorities for action in Europe related to eHealth. The priorities are to enable

citizens to securely access their health data across the borders, to allow pooling of research resources and share data to enable personalised medicine across the EU, and finally, to empower people to look after their health using digital tools, particularly in relation to prevention and interaction between users and health care providers. The third priority is the one related most to users' habits and affected by their digital skills and availability of resources, official and non-official, splitting into two main activities, seeking health-related information and interacting with health service providers.

Seeking health-related information does not necessarily involve official sources, and the change in how many individuals do use the Internet in this aspect is related to level of digital skills they have and motivation. This aspect had the most considerable average increase across all aspects studied in this article, showing that citizens indeed are interested and motivated to using the Internet to seek information related to health. The data from Eurostat (Eurostat, 2018) shows a constant increase over the past ten years among all countries studied. In 2008, the lowest country in terms of percentage of individuals seeking information on health online was Bulgaria, with less than 7 percent, and the highest Hungary with 28 percent and a regional average of 20 percent, lower than the EU average of 27 percent, these numbers differed vastly to reach a regional average of around 49 percent, ranging between 33 percent for Romania, and 59 percent for Estonia, nonetheless, even with an average annual increase of 2.8 percent. This, however, did not match the increase in other regions in Europe, as the EU average jumped to 51 percent, but with slower growth, at an annual average increase of 2.36 percent. This feature was one of the only two aspects with regional average annual growth higher than that of regular Internet users, with 2.8 percent, compared with 2.6 (Eurostat, 2018e).

### Individuals using the Internet to seek health-related information

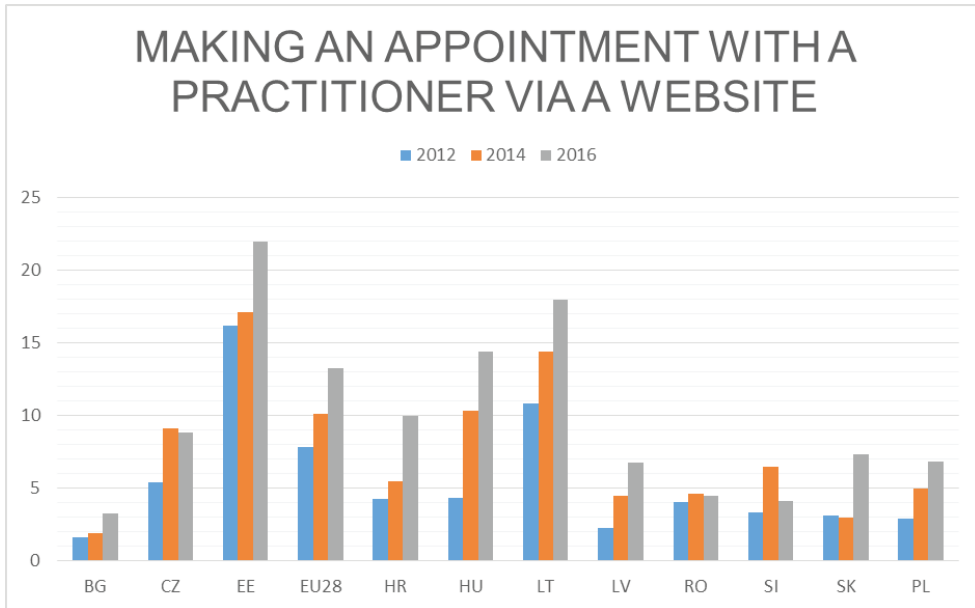


These results show that the overall region is indeed advancing in terms of using digital tools to access health related information, to look for their health at a rate higher than that of the whole EU region. More specifically, six of the eleven countries – Estonia, Hungary, Lithuania, Slovenia, Croatia, and Czech Republic – have percentage of individuals seeking health information online higher than EU overall average, though marginally. The lowest performers were, once again, Romania and Bulgaria with around 33 percent each, and this is in line with the lowest performances in terms of access and digital skills.

A similar case about growth rate can be also made with using the Internet to interact with health service providers, including getting an appointment with a health practitioner using digital means. In this area, couple of East EU countries managed to triple the number of people using the Internet for this purpose in the four year period between 2012 and 2016. These countries are Hungary and Latvia, while other countries managed to increase the use significantly, doubling their numbers, as in Croatia, Slovakia, Poland, and Bulgaria. Unfortunately, this growth in percentage of people using the Internet for local eHealth does not reflect the fact that the number of individuals is rather low, stretching between a mere 3.3 percent as in Bulgaria, and 22 percent in Estonia, 50 percent over the European Union average (Eurostat, 2018d).



### Individuals using the Internet to make appointments with health practitioners



It is important to consider the nature of this type of usage, and how it requires that health service provider makes the facility to interact with them and makes appointments online available, as well as the need for visiting health practitioners. However, when compared to the overall EU average, we can clearly see that Estonia, Latvia, and Hungary are the only countries in the region that are above the EU average, while the rest of the countries are significantly below that, with Bulgaria tailing the list at 3.3 percent.

The level of usage here gives an idea on the opportunities people are using to utilise the development of digital technologies towards affecting their health and relationship with health providers. This affirms the results mentioned earlier from the communication on health and technology in Europe, that there are high inequalities in how different countries and regions in the EU are interacting with health-related issues using digital technologies.

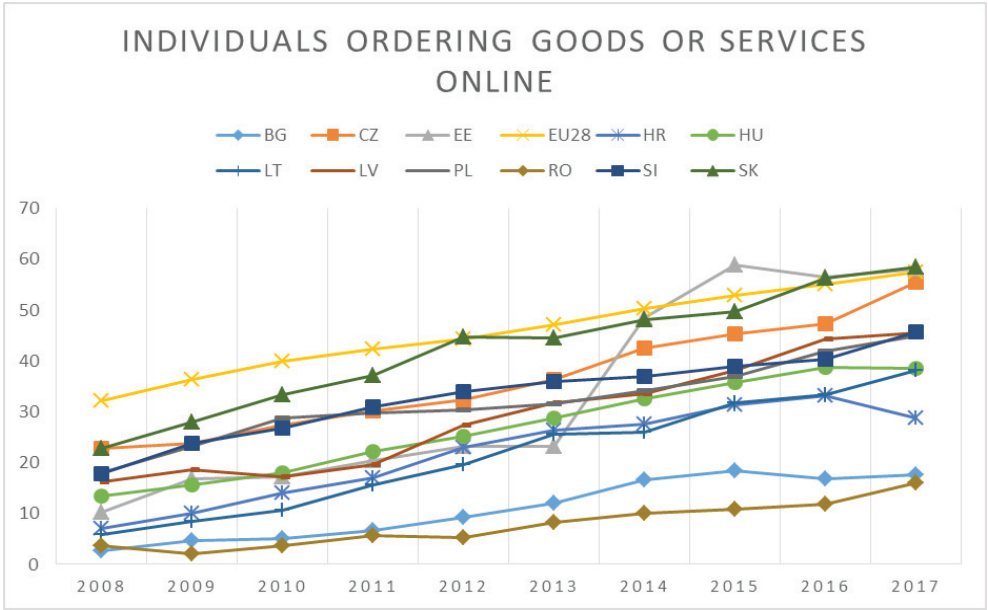
## eCommerce

Finally, the other main outcome affecting our daily lives we looked at is the eCommerce, which became the main method adopted by many people to buy or sell products. In Europe, the number of people ordering goods or services online has jumped from less than one-third of the population to well over half, in the ten

years between 2008 and 2017 (Eurostat, 2018b). Showing the interest people have gained in this aspect of Internet use, and the advancement in offering and required support infrastructure (Eurostat, 2018b). In East Europe, the adoption has also increased, bypassing in many countries the EU average of use, and in all but two countries, having faster growth than the EU average.

Chart 6

Percentage of people using the Internet to order services or goods



Between 2008 and 2017, the average annual growth in individuals ordering good or services online in East Europe was 2.8 percent, higher than the EU average of 2.5 (Eurostat, 2018b). This change did not, however, occur equally across the region. Indeed, only two of the eleven countries in the region – Romania and Bulgaria – had growth slower than the EU average, while the other nine had significant growth. These data, once again, confirm the bad performance of these two countries in terms of digitalization.

Other East EU countries, such as Estonia, had a growth rate of 4.8 percent over the period studied, increasing numbers of individuals using eCommerce from 10 percent in 2008 to 58 percent in 2017, a little over the 57 percent of the whole EU. Slovakia was the other country in the region to reach an average higher than the EU, at 58.5, but with slower annual average change of 3.6 percent since it started with much higher percentage, at 22 percent. Other countries have also

achieved good growth such as Czech Republic at 55 percent, and Slovenia, Latvia, and Poland all around 46 percent (Eurostat, 2018b). Inequalities in terms of eCommerce are evident within East EU, with countries – Bulgaria and Romania – struggling at a mere 18 and 16 percent of individuals using eCommerce, raising from 2.6 and 3.7 ten years ago, respectively. These differences are reflected also on a micro level, where consumers' patterns and habits are changing with the introduction of eCommerce. More and more consumers tend to order goods and services online. However, also in this case, we can observe similarities amongst East EU countries, but also strong inequalities in the way citizens access and use the Internet to gain some concrete benefits, such as eCommerce.

## **Conclusions**

The aim of this article was to shed light into some features that characterize digital inequalities across Europe, and specifically across the East EU countries. We have shown how strongly digital inequalities, in terms of digital access, digital skills and tangible outcomes gained from the Internet, are evident between these countries. At the same time, we have also noticed similarities, between some countries, in the way they speed up the process of digitalization in order to catch up with other European countries. In some case, we have noticed, that some countries constantly score above Europe Union average, showing excellent performance in terms of Internet penetration, digital skills and digital engagement. More specifically, as we have seen, Internet penetration is rapidly growing everywhere in Europe, strongly reducing the number of citizens who are totally excluded from accessing the Internet. However, while gaps in accessing the Internet are shrinking, it is wrong to assume that the first level of digital divide has been bridged. Indeed, as we have seen, significant differences still exist between North and East EU countries and even within East Europe itself. Particularly significant are the differences between the Baltic countries and Romania and Bulgaria that are at the very bottom of Europe ranking in terms of Internet penetration. Furthermore, as noted above, access to the Internet is only one of the criteria to examine digital inequalities. Other forms of digital inequalities persist and grow, and are related with digital skills, and with the uses of digital services, integration of digital technology, and digital public services to improve the quality of their life. Specifically, while analysing the second level of digital divide, we focused mainly on the inequalities on the level of digital skills. This is one of the limitations of this article, since the second level of digital divide cannot be reduced only to the digital skills. However, digital capabilities and skills in using the Internet efficiently and confidently play a key role in determining digital inequalities and provide a robust picture

of the inequalities in the Internet usage and activities users carry on online. Finally, in the attempt to bring to light meaningful insights into the third level of digital divide, we concentrated on some of main outcomes deriving from an efficient and purposeful use of the Internet, and namely the digital engagement with eGovernment and public services, eHealth, and eCommerce. Another limitation of our article is that these three outcomes are not exhaustive of the whole panorama of tangible outcomes that determine the third level of digital divide. Furthermore, we analysed them only at the macro level, comparing countries instead of individuals with different socio-cultural backgrounds. However, we assumed that engaging efficiently with eGovernment and public services is a real and tangible outcome that improves the quality of citizens' life. The same applies to eHealth and eCommerce, since improving both the quality of health and economic exchanges (both in terms of buying and selling goods and services) are concrete outcomes deriving from different access and skills in using ICTs.

In this study, we have revealed, though partially, differences in access, usage and benefits exist across Europe, and specifically in East EU countries. We have also seen that not necessarily increasing the growth of Internet penetration implies an automatic and proportional increase in digital skills or tangible benefits. Future research should also determine whether there is any growth or reduction of these three levels of digital divide in other countries in Europe and if these trends follow a similar path. Finally, future study should also include other dimensions of digital inequalities and more tangible outcomes.

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